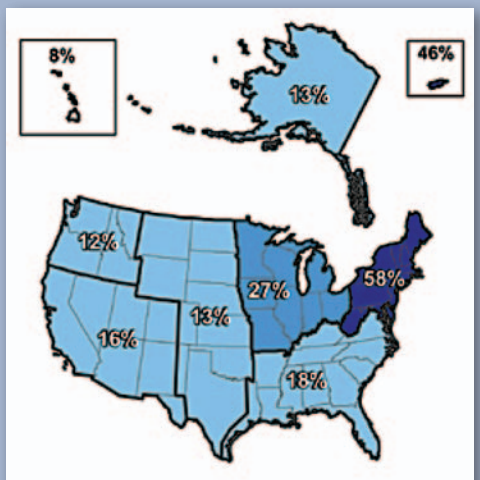
FACT SHEET

LID as a Climate Change Adaptation Tool

Low Impact Development can play an important role in climate adaptation planning for municipalities. Through the use of LID practices, resiliency can be planned into a watershed.

Through this century, climate projections show an increased frequency of larger precipitation events. This projected increase in higher rainfall events must be considered in the context of continued development of a watershed.

NOAA indicates that average precipitation has increased by approximately 6% in the lower 48 contiguous states. In regions of the Northeast and Midwest, the increase has been 10-20% since the beginning of the 21st century. Research has shown that an increase in average precipitation translates to a disproportional increase in frequency of larger precipitation events.



Increase in Heavy Rainfall Events:
Annual Number of Days, 1958-2007

RESILIENCE

The ability of a system to absorb and rebound from weather extremes and climate variability and continue to function.

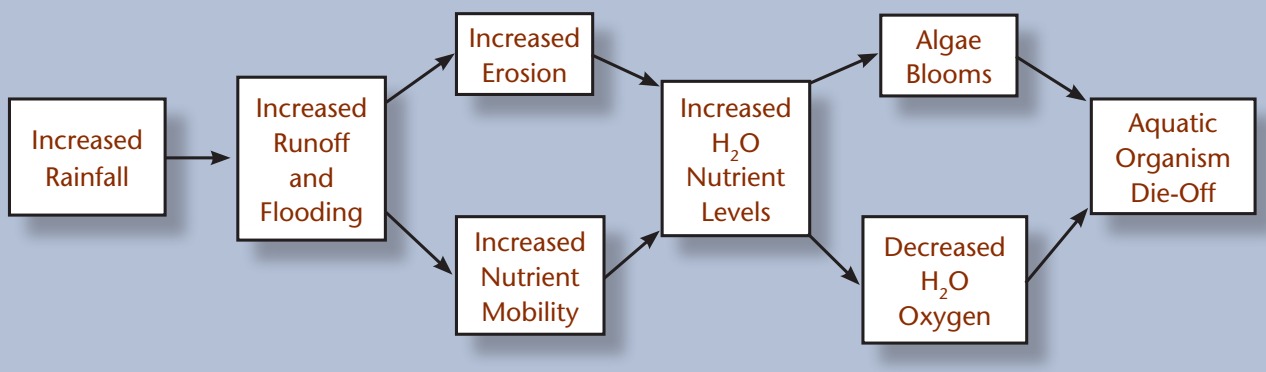
ADAPTATION

Any action or strategy that reduces vulnerability to the impacts of climate change. The main goal of adaptation strategies is to improve local community resilience.

As watersheds are developed, the increase in impervious surfaces results in a decrease in the ability of precipitation to infiltrate into soils. The addition of the dynamics of climate change to watershed build-out will result in increased runoff and in more frequent and higher flood waters, which can threaten both natural systems and built infrastructure.

At the municipal level, planning decisions should incorporate design capacities that can assimilate these projections. The option of not doing anything to prepare for climate change will increase risk to the community.

FORGING THE LINK

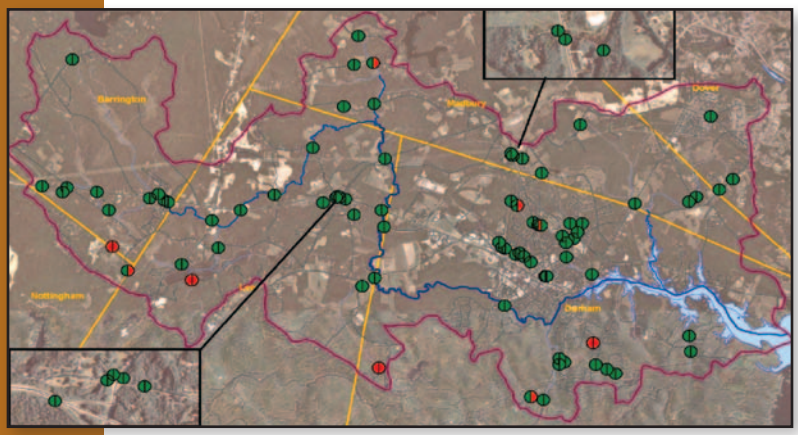


Primary, Secondary, and Tertiary Impacts Due to Climate Change Effects on Rainfall and Runoff

One study in New England provided an analysis of the changes in climate and related impacts to culverts, whose capacity had been designed based on historic designs storms. The study examined the use of LID to mitigate future impacts from increased runoff caused by both climate change and watershed development.

LID systems can mitigate impacts from increased precipitation by

- increasing infiltration,
- reducing runoff volumes, and
- delaying the runoff peak.



Culverts Analyzed Within the Oyster River Basin; red symbols indicate vulnerability.

The implementation of LID practices reduced the number of culverts determined to be undersized by 29 to 100 percent. Additionally, when considering the marginal cost increase to replace such undersized culverts, LID approaches were projected to reduce the total marginal cost increase across the watershed by one-third.

Per-Culvert Marginal Costs by Land-use Scenario, with Recent Precipitation Amount

Land Use	Marginal Cost Per Culvert	% Increase Over Current Land Use
Current	$2,952	—
Build-Out	$3,596	22%
LID	$3,372	14%

These results indicate that in addition to the water quality benefits of LID, wide-scale implementation can also build community resiliency and reduce the economic impacts from build out and increased precipitation trends.

FORGING THE LINK: Linking the Economic Benefits of Low Impact Development and Community Decisions • www.unh.edu/unhsc/forgingthelink
Chapter 5: LID as a Climate Change Adaptation Tool

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